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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,034	01/25/2002	Kenichi Oishi	461-76	8940
23117	7590	03/25/2004	EXAMINER	
NIXON & VANDERHYE, PC 1100 N GLEBE ROAD 8TH FLOOR ARLINGTON, VA 22201-4714			DONOVAN, LINCOLN D	
			ART UNIT	PAPER NUMBER
			2832	

DATE MAILED: 03/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/055,034	Applicant(s) OISHI ET AL.	
	Examiner Lincoln Donovan	Art Unit 2832	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 6-15 is/are pending in the application.
- 4a) Of the above claim(s) 6 and 7 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 8 and 10-15 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 11 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 11, there is no antecedent basis for "the first non-magnetic layer" and "the second magnetic layer."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrillo et al. (US 6,543,744).

Regarding claims 1 and 8, Carrillo et al. disclose an electromagnetic device comprising:

- a movable core (64);
- a stator (44) for housing the movable core in such a manner as to move in a reciprocating fashion therein and an attracting portion between which and the

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movable core a magnetic force is generated for attracting the movable core to one of reciprocating movement directions and cooperating with the movable core to form a magnetic circuit

- a coil (40J for generating a magnetic force which attracts the movable core to the attracting portion side when energized;
- a thin non-magnetic layer (52) formed on at least one of sides where the housing portion and the movable core are situated, respectively, to diametrically face each other; and
- a coaxial air gap (86, figure 3) formed between the movable core and stator.

Carrillo et al. disclose the instant claimed invention except for the specific eccentricity ratio.

Carrillo et al. discloses a gap of 0.3 to 0.55mm between the inner housing wall and the outer surface of the movable core. Carrillo et al. further shows a gap between (including the width of the housing layer, figure 3) being 0.5 to 2mm.

It would have been obvious to one of ordinary skill in the art at the time the invention that the gap between the inner housing wall and the outer surface of the movable core would be between 20 and 60% in order for the device to function efficiently.

Claims 2-3, 11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carrillo et al., as applied to claim 1 above, and further in view of Jabcon (US 6,405,757).

Carrillo et al. disclose the instant claimed invention except for the thickness of the non-magnetic layer being between 40 and 80 micrometers.

Regarding claims 2, 11 and 13-15, Jabcon discloses a stainless steel non-magnetic layer (42) interposed between a plunger and 26) and stator assembly (figure 4) having a thickness between 40 and 80 micrometers (column 6, lines 41-58).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to use the thickness of Jabcon for the magnetic layer of Carrillo et al., as modified, for the purpose of permitting free armature movement while minimizing magnetic losses.

Regarding claims 3, 14 and 15, stainless steel has a hardness between HV200 and HV300. The specific hardness used for the sleeve and core would have been an obvious design consideration based on the specific operating strength necessary and operating environment.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carrillo et al., as applied to claim 1 above, and further in view of Myers (US 4,470,030).

Carrillo disclose the instant claimed invention except for the use of a polyamide Teflon coating for the non-magnetic material.

Myers discloses a polyamide Teflon sleeve (66) used with a solenoid plunger (128).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a teflon coating for the non-magnetic member of Carrillo in order to reduce friction.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Carrillo et al., as applied to claim 1 above, and further in view of Phelan (US 4,399,483).

Carrillo disclose the instant claimed invention except for the specific control circuit for the electromagnetic device.

Phelan discloses a circuit for controlling an electromagnetic device such that the current supplied to the coil reaches a saturation point of the magnetic circuit (abstract).

It would have been obvious to a person having ordinary skill in the art at the time invention was made to include a control circuit with the electromagnetic device of Carrillo et al., as suggested by Phelan, for the purpose of providing control of the plunger operation.

The specific range of saturation current necessary would be dependent upon the materials used for the circuit and the size of the winding.

Allowable Subject Matter

Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments with respect to claims 1-3 and 8-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

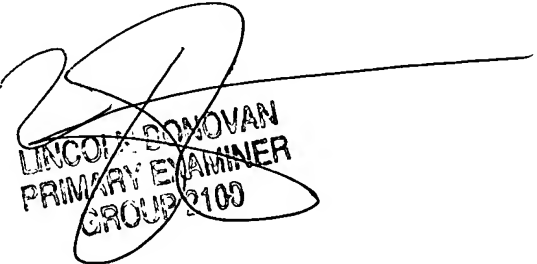
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lincoln Donovan whose telephone number is (571) 272-1988. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Elvin Enad can be reached on (571) 272-1990. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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LINCOLN SOMOVIAN
PRIMARY EXAMINER
GROUP 2100